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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/715,558

11/19/2003

Tuong Luoh

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5065

7590

12/23/2004

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EXAMINER

DANG, PHUC T

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/715,558	<b>Applicant(s)</b> LUOH, TUUNG	
	<b>Examiner</b> PHUC T DANG	<b>Art Unit</b> 2818	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8 and 9 is/are rejected.
- 7) ☒ Claim(s) 5-7 and 10-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>041204 &amp; 050604</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2818

## **DETAILED ACTION**

### **Oath/Declaration**

1. The oath/declaration filed on December 31, 2003 is acceptable.

### **Information Disclosure Statement**

2. The office acknowledges receipt of the following items from the applicant:

Information Disclosure Statement (IDS) filed on April 12, 2004 and May 6, 2004.

### **Specification**

3. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Objection(s)**

4. Claims 10-21 are objected to because for the following reasons:

In claim 10. lines 9, a term "the floating gate" should replace by -- the polysilicon floating gate --.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2818

5. Claims 1-4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhee et al, hereinafter "Rhee" (U.S. Patent No. 6,667,525 B2) in view of Kirchhoff (U.S. patent No. 6,713,364).

Regarding claim 1, Rhee discloses a method of forming a polysilicon layer in a semiconductor device, comprising:

- providing a substrate (21, Fig. 4);
- forming an oxide layer (22, Fig. 4) over the substrate;
- depositing a first silicon layer (210, Fig. 4) over the oxide layer;
- depositing an amorphous silicon layer (211, Fig. 4) over the first silicon layer; and
- annealing the amorphous silicon layer to form a polysilicon layer [col. 5, lines 25-50].

Rhee discloses all the features of the claimed invention as discussed above, but does not disclose the first silicon layer comprises microcrystalline polysilicon.

Kirchhoff, however, discloses the first silicon layer comprises microcrystalline polysilicon [col. 3, lines 16-21].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Kirchhoff to Rhee discussed above such that the first silicon layer comprises microcrystalline polysilicon for a purpose of improving the performance of the flash memory device.

Regarding claims 2, Rhee discloses the parameters of the characteristics of the first silicon layer is performed in the environment of the process [col. 5, lines 31-35].

Art Unit: 2818

Regarding claim 9, Rhee discloses the thickness of the amorphous silicon layer used in the process [col. 5, lines 67-col. 6, lines 2].

6. Rhee discloses the claimed invention except for the process parameters as claimed in claims 2-3 and 8. However, the selection of the claimed process parameters would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the performance of the flash memory device, since it is well settled that when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

#### **Allowable Subject Matter**

7. Claims 10-21 would be allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 10-21 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention having a step of forming a polysilicon floating gate over the oxide layer including providing a bottom seed layer having microcrystalline polysilicon, providing an upper amorphous silicon layer over the bottom seed layer.

Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim.

Claim 10 would be allowable if rewritten or amended to overcome the objection(s) set forth above in this Office action.

Art Unit: 2818

### Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PD



Primary Examiner

Art Unit 2818